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IS : 6124 - 1971

*Indian Standard*  
METHOD FOR  
DETERMINATION OF CRIMP IN WOOL

UDC 677.31 : 677.014.886



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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 1

Price Rs 2.00

October 1971

Gr 2

# *Indian Standard*

## METHOD FOR DETERMINATION OF CRIMP IN WOOL

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# *Indian Standard*

## METHOD FOR DETERMINATION OF CRIMP IN WOOL

### 0. FOREWORD

**0.1** This standard was adopted by the Indian Standards Institution on 17 May 1971, after the draft finalized by the Physical Methods of Test Sectional Committee had been approved by the Textile Division Council.

**0.2** The 'waves' or 'curls' present in wool fibre are called 'crimp'. Uniformity and abundance of crimp are the indices of good quality wool. Usually the crimp is assessed either by counting the number of 'waves' or 'curls' present in the fibre and expressing it as the number of 'waves' or 'curls' per unit length or by measuring the difference in length of fibre between its unstretched and stretched condition and expressing it as a percentage of the fibre length in the unstretched condition. Because the Indian wools do not possess well defined 'waves' or 'curls', this method adopted in this standard is based on the later principle. The assessment of crimp, in wool fibre, is generally helpful to the sheep-breeder to judge the effects of pasture and cross-breeding on the quality of wool. Also, the evaluation of crimp in wool fibre is essential for the purpose of grading wool on a rational and scientific basis.

**0.3** In reporting the result of a test, in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960\*.

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### 1. SCOPE

**1.1** This standard prescribes a method for determination of crimp in wool fibres obtained from the bales, bags, heaps or fleece.

### 2. TERMINOLOGY

**2.0** For the purpose of this standard the following definitions shall apply and for other terms reference to IS : 232-1967† be made.

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\*Rules for rounding off numerical values (*revised*).

†Glossary of textile terms — natural fibres (*first revision*).

**2.1 Crimp** — The natural waviness of wool fibre; it is expressed numerically by the difference, in length of the fibre between its unstretched and stretched condition expressed as a percentage of the length of fibre in unstretched condition.

**2.2 Tuft** — A bunch of wool fibre sheared from the fleece or drawn from the sample.

### 3. SAMPLING

**3.1** Test sample to determine the crimp in wool fibre in a lot shall be selected so as to be representative of the lot.

**3.2** Test sample drawn in compliance with an agreement between the buyer and the seller or as stipulated in the material specification shall be held to be representative of the lot.

### 4. PREPARATION OF TEST SAMPLES

**4.1** The gross sample drawn shall be thoroughly mixed. It shall then be spread out on a table in the form of an uniformly thick layer and divided in 16 zones. A tuft of about 100 to 200 g ( depending on the quality of wool ) shall be taken from each zone without disturbing the lock formation as far as possible.

**4.2** Each tuft shall be divided into 2 approximately equal parts, taking care to avoid breaking of the fibres and one of the parts shall be discarded in each case. The other portion shall be again divided into 2 parts and one part of it again rejected. This process shall be repeated till about 50 fibres remain in each retained part. All the retained parts of fibre taken together shall constitute the **test sample**. The other parts which are to be discarded shall be collected together to constitute a **duplicate test sample**.

### 5. ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTING

**5.1** Prior to test, the test sample shall be conditioned to moisture equilibrium from dry side in the standard atmosphere of  $65 \pm 2$  percent relative humidity and  $27 \pm 2^\circ\text{C}$  temperature ( *see also* IS : 196-1966\* ).

NOTE — When the test samples have been exposed to standard atmosphere for at least 24 hours, in such a way as to expose as far as possible all portions of the samples to the atmosphere they shall be deemed to have reached moisture equilibrium.

**5.2** The test shall be carried out in a standard atmosphere ( *see* 5.1 ).

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\*Atmospheric conditions for testing ( *revised* ).



## 6. APPARATUS

**6.1** For the purpose of this test, the following apparatus will be used:

- a) *Velvet Board* — of black or any other contrasting colour;
- b) *Flat Transparent Scale* — graduated in centimetres and millimetres, and
- c) *Two Pairs of Forceps*.

## 7. PROCEDURE

**7.1** From the conditioned sample draw at random at least 300 fibres. From these fibres take one fibre and lay it straight without stretching, on a velvet board. Place the scale over the fibre without disturbing it. Measure the unstretched length  $L$  correct to nearest millimetre, from end to end of the fibre. Take the same fibre and straighten it out by means of the pairs of forceps, taking care not to stretch it but merely to remove its crimp. Place it on the velvet board and measure straightened length  $L_1$  to nearest millimetre from end to end of the fibre as above.

**7.2** Similarly determine the unstretched and stretched lengths of the remaining fibres, making a total of 300 observations.

## 8. CALCULATIONS

**8.1** Calculate the crimp of each fibre by the following formula:

$$\text{Crimp, percent} = \frac{L_1 - L}{L} \times 100$$

where

$L_1$  = stretched length of fibre, and

$L$  = unstretched length of the same fibre.

**8.2** Calculate the mean crimp percentage, the standard deviation, the co-efficient of variation and the standard error of the mean of all the observed values.

**8.3** If the standard error of the mean so calculated is less than 5 percent the mean crimp obtained as in **8.2** shall be reported and if the standard error of the mean so calculated is equal to or more than 5 percent, determine the number of fibres required to make test at 5 percent level of significance, and test them following the procedure given in **7.1**.

**8.3.1** Calculate again, the mean crimp percentage and report.

## **9. REPORT**

**9.1** The report shall include the following information:

- a) Type of material,
- b) Crimp,
- c) Standard deviation,
- d) Co-efficient of variation,
- e) Standard error of mean, and
- f) Number of observations.